

# Hazardous Area Installations – The European ATEX Directive

## An Important Step Forward in Hazardous Area Safety



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### What Is the ATEX Directive?

The ATEX Directive is the Explosive Atmosphere Directive (LAW) for the European Union (EU).

#### ATEX Directive 94/9/EC

The ATEX Directive (from the French "ATmospheres EXplosible") came into effect on a voluntary basis on 1 March 1996 and will be mandatory beginning 1 July 2003. The Directive covers equipment and protective systems which may be used in areas endangered by potentially explosive atmospheres created by the presence of flammable gases, vapors, mists, or dusts. From 1 July 2003, it will be necessary for all products placed on the market or put into use to comply with the Directive, even if they are only intended for use in their country of origin. The ATEX Directive is applicable to all 15 Member States of the European Union (EU), and has also been adopted by the Czech Republic, Norway, and Switzerland.

"Equipment" is defined as any item, electrical or mechanical, which contains or constitutes a potential ignition source and which requires special measures to be incorporated in its design and/or its installation in order to prevent the ignition source from initiating an explosion in the surrounding atmosphere. Also included in the term "equipment" are safety or control devices installed outside the hazardous area but having an explosion protection function. A wide range of products fall within the definition of equipment, including electric motors, compressors, diesel engines, lighting fittings, control and communication devices, and monitoring and detection equipment.



"Protective systems" are items that prevent an explosion (that has been initiated) from spreading or causing damage. These include flame arresters, quenching systems, pressure relief panels, and fast-acting shut-off valves.

**CE** The EU ATEX Directive forms part of the "CE" marking regulations. Although this may appear to be protectionist, the background to the Directive is based on the need for the harmonization of standards and safety requirements. In recent years, IEC Standards have been published which attempt to set worldwide standards for hazardous area equipment. These standards are the result of several years of work by the national and regional standards bodies, such as CSA and CENELEC. The purpose of the ATEX Directive is to enforce the Euro-norm (EN) version of new standards within Europe. Most products will require certification by a "European Notified Body."

A Notified Body is a body that is independent of the supply of the products and has the necessary technical competence and administrative structure to assess the conformity of products and manufacturers within the requirements of the Directive. A Notified Body must be appointed and approved by its government, who in turn notifies the European Commission of the appointment. In general, they will be the recognized certification bodies in their field. Bently Nevada has been working with three such bodies, EECS (BASEEFA), LCIE, and SIRA, in order to obtain the necessary Certification for our products.

### What Implications Are Attached to This Directive?

First, the existing Certificates issued by the European Test Houses, such as BASEEFA, LCIE, and PTB, will become invalid for manufacture and installation after 1 July 2003.

This means that some Bently Nevada certified hazardous area products would cease to be available within the EU for hazardous area installation after that date, including the supply of spares. Most of these products, however, are currently subject to the stated Bently Nevada obsolescence procedure. The products due for withdrawal are listed in Tables 1 and 2.

Table 1.

Product Number	Product Description	Withdrawal Date
Probes	All 190/3000/7000/7200 Series	1 March 03
20929	3000 Proximito®	1 March 03
12237	7000 Proximito®	1 March 03
BA19049	7200 11 mm Proximito®	1 March 03
BA9066	Tachdriver	1 March 03
40892	7200 REBAM® MicroPROX®	1 March 03
330100	3300 (Classic, non XL) Proximito®	1 March 03
330600	3300 REBAM® MicroPROX®	1 March 03
330900	3300 RAM Proximito®	1 March 03
Probes	3300 (Classic, non XL) Probes	1 March 03
BA16699	Seismoprobe 3 wire	1 March 03
BA39158/47633	Seismoprobe General Purpose	1 March 03
BA24646	Seismoprobe 3 wire HiTemperature	1 March 03
BA14386	Velocity to Displacement Converter	1 March 03
BA38035	Velocity to Velocity Interface	1 March 03
BA26233	Seismoprobe Radiation Resistant	1 March 03
BA26862	Seismoprobe Low Frequency	1 March 03
86205	Seismoprobe Low Cost/TM2000	1 March 03
BA23732	Accelerometer Standard	1 March 03
BA23733	Accelerometer Interface	1 March 03
89129	Accelerometer Low Cost/TM2000	1 March 03
24145	Accelerometer Interface High Freq.	1 March 03
24147	Accelerometer High Frequency	1 March 03

Table 2.

Product Number	Product Description	Withdrawal Date
3300/XX	3300 Monitor System (ExN)	1 March 03
3300/XX	3300 Monitor/Barrier System	1 March 03
88149	3300 Internal Barrier, Proximito®	1 March 03
88157	3300 Internal Barrier, Velocity	1 March 03
88194	3300 Internal Barrier, Keyphasor®	1 March 03
102550	3300 Internal Barrier, Temperature	1 March 03
	<b>Note:</b> Barriers are an integral part of the Monitor Signal Module.	
1800/XX	1800 Monitor System	1 March 03
	<b>Trendmaster® 2000 ExN:</b>	
85013	Velocity TIM (Classic)	1 March 03
85014	Process Variable TIM (Classic)	1 March 03
85015	Temp Pt 100TIM (Classic)	1 March 03
85016	Temp J T/C TIM (Classic)	1 March 03
85017	Temp K T/C TIM (Classic)	1 March 03
85018	Displacement TIM (Classic)	1 March 03
85019	REBAM® TIM (Classic)	1 March 03
85020	Keyphasor® TIM (Classic)	1 March 03
86950	Velocity TIM (Classic)	1 March 03
85716/85717	TIM Housing ExN 4P / 8P	1 March 03
	<b>Trendmaster® 2000 Intrinsically Safe:</b>	
88311/87227	TM2000 Barrier Housing St Stl / FBG	1 March 03
88312/13/14/15	W/P Tim Housings I.S.	1 March 03
85023	Velocity TIM (Classic)	1 March 03
85025	Temp Pt 100TIM (Classic)	1 March 03
85026	Temp J T/C TIM (Classic)	1 March 03
85027	Temp K T/C TIM (Classic)	1 March 03
85674	Line Extender	1 March 03
85722	'T' Connector ExN	1 March 03
85727	'T' connector I.S.	1 March 03
88255	Keyphasor® TIM (Classic)	1 March 03
88262	REBAM® TIM (Classic)	1 March 03
88269	Displacement TIM (Classic)	1 March 03
88276	Velocity TIM (Classic)	1 March 03
89546	Acceleration to Velocity TIM (Classic)	1 March 03

Those end-users that do not have a reasonable “spares supply” for the transducers and monitors located within hazardous areas of their plants, should carry out an audit of requirements and then ensure that sufficient spares are purchased prior to the proposed BN cut-off date. The cut-off will be 01 MARCH 2003. This will enable any goods in transit to clear customs by the enforcement date.

Spare Parts covered by the Directive are equipment, assemblies, and modules, but not individual components such as electronic or mechanical components.

Please see <http://europa.eu.int/comm/enterprise/atex/q&a.htm> for the European Commission Standing Committee Draft Question & Answers (29 June 2001) on the supply and use of non-ATEX spares at the end of the transition period. The EU has recently clarified the fact that spares purchased and in end-user's hands by 1 July 2003 may be used as replacements for existing installed parts.

End-users who own our systems may wish to utilize Bently Nevada Services to review the installed transducers and monitors as well as spares. Services can then make recommendations on the best option for obtaining ATEX-compliant spares or upgrades.

Second, all new equipment and installations must comply with the Directive. BN is designing, manufacturing, and having all new products certified in accordance with the Directive, and we are well forward in the re-certification program for existing products that will continue to be offered. The requirement for IID (Dusts) will be addressed after the work on IIG products has been completed and the relevant standards are adopted.

Third, the interconnection of ATEX products and non-ATEX products may be subject to review and restrictions.

For example:

Bently Probe and Proximitor® Certificates state the certificate numbers of the corresponding parts. Therefore, it is theoretically a mandatory requirement to change out the complete transducer system. However, with regard to the proximity probes, there are no physical changes required to meet the new certification requirements, only that the new certificate label be used on new products. So, the end-user may make the decision to leave the probe in place when changing out the Proximitor®, or vice versa.

Another case may concern a new ATEX-Certified I.S. proximity probe and Proximitor® connected (as a replacement) to an existing Zener Safety Barrier.

If the probe and Proximitor® are a like-for-like identical replacement, they will have the same safety characteristics, and would therefore appear to be an acceptable replacement without changing the barrier. However, the certification standards have changed, reducing the Capacitance values in IIC to roughly half, while at the same time increasing those for IIA and IIB to nearly double. The answer to this case may well be the requirement to review the barrier for suitability. Then, of course, the existing field cable must be reviewed for suitability regarding the capacitance and inductance.

Finally, the replacement of ExN Components with EExn ATEX Assessed products may give rise to certification compatibility issues. These products are now referred to as Category 3 Equipment, and therefore no actual legal requirement exists for such items to be certified by a Notified Body. However, there is a requirement for the product to meet the declaration and marking requirements of the Directive, and means that any competent person may make that declaration. We know that this situation would not be acceptable to the majority of our customers, who know and respect the value of third-party assessment and certification. It does, however, open the door to the use of a “technical construction file” approach to meet the problem.

It may be totally acceptable to the customer to have a new ATEX EExn Assessed Proximitor® installed in an old ExN Proximitor® housing where the machine monitoring requirements have changed and additional transducers are added. Similarly, a new Proximitor® housing may be required to replace an existing one that has been damaged.

With working parties, manufacturers, and end-users raising questions regarding the Directive requirements at this moment in time, we currently do not have all the answers we would like. Despite the requirements for harmonization within the EU, there are already differing national interpretations emerging within the Member States.

There will be some questions about the specification and installation requirements of BN products under the ATEX Directive. As a responsible hazardous area product manufacturer, we will review these concerns as they are raised, and will record the appropriate responses.

## **Hazardous Areas:**

The ATEX Directive makes some changes to the traditional classification of Hazardous Areas. While the original concepts of Group I for Mining and Group II for Surface Industries remain in place, an additional classification has been added for Dust risk.

Petrochemical plants, by their nature, involve the processing of volatile liquids and gases. The risk assessment applied to the process plant by the designers and assessors divides the areas into Zones 0, 1, and 2, dependent upon the nature and likelihood of the risk.

Traditionally, European classification of Hazardous Areas has limited itself to those areas of risk caused by volatile liquids, mists, and vapors. However, for many years, the North American standards have covered the risks caused by dusts and flyings, such as in coal-crushing plants and flourmills. The risk for these is considerably lower than with gases, vapors, and mists, because higher energy is needed to ignite the dust/air cloud, and higher surface temperatures to ignite the layers of dust. In Europe, certification standards are now being put in place for these dust-risk areas as part of the ATEX Directive.

The zoning classification follows similar rules to those for gases, except for the notation. Dust-risk zones are prefixed

with a 2; thus, the highest risk where a combustible dust/air mixture is present at all times under normal operating conditions becomes Zone 20; where the dust/air risk is present under normal operating conditions for long periods of time becomes Zone 21; and areas where the dust/air risk is present for short periods of time under fault conditions becomes Zone 22.

Under the associated ATEX 1999/92/EC "User" Directive, limitations are put in place on access into and the protection of personnel into Zones 0 & 1, while the ATEX 94/9/EC Directive dictates the type of equipment that can be installed within the classified hazardous areas. Condition data from these hazardous areas remains vital for the safe operation and asset management of the plant. The instrumentation required in those areas must therefore comply with the required certification standards and directives.

It is imperative that the Bently Nevada designers and installers obtain the required information on the hazardous areas in which they are to work or provide equipment to operate. This information is usually obtained by consulting the "Zone Map", which is a legal requirement for facilities having flammable substances. From this map, the Bently Nevada personnel are able to determine the most applicable and compliant transducers and systems.

### Equipment Categories:

A new concept of Equipment Categories will be introduced, with products designed to comply with specific risk types:

- Category M: Mining (Group I)
- Category G: Gases, Vapors, and Mists
- Category D: Dusts

The ATEX certification standards now classify equipment intended for use in mines endangered by firedamp and/or coal dust as Group I Equipment Category M1 & M2. Bently Nevada does not currently hold certification for this type of equipment.

The traditional petrochemical surface industry Group II areas utilize Equipment Categories 1G, 2G, or 3G, which are suitable for use in hazardous Zones 0, 1, and 2, respectively. The new ATEX standards now classify equipment used in a surface industry Group II dust environment as Equipment Categories 1D, 2D, or 3D, for use in Zones 20, 21, and 22, respectively.

New rules have been introduced that govern the introduction of equipment assessed to EN50021 into Zone 2 (Category 3 under ATEX). Bently Nevada has previously offered ExN equipment to the British Standard BS 6941. This was not a CENELEC (EN) standard and is therefore not generally acceptable within Europe.

The new EExn concept is now available for use, providing the opportunity to install energy limited products in the Zone 2 area without the use of barriers or isolators.

### Mechanical and Physical Implications:

The Directive not only requires electrical and electronic equipment to meet the requirements, it also requires machinery that is being installed in such areas to meet new mechanical requirements. Attention must now be given to hot exposed surfaces, friction "hot" points, and the possibility of metallic sparking due to static parts rubbing on rotating or moving parts in potentially explosive atmospheres.

This means that some machinery cannot comply directly with the ATEX Directive 94/9/EC. Official guidelines will be issued shortly to explain how gas turbines can comply with the essential safety requirements of the ATEX Directive. Essentially, the solution is that the gas turbine will not be CE marked until it is incorporated into a package. The safety measures taken to ensure that the hot surface cannot become a source of ignition will then be documented in the Explosion Protection Document, under ATEX 118a.

In all cases, reasonable and practical precautions are required to guard against known types of failure that can cause ignition of the surrounding atmosphere.

### Quality Requirements:

The Directive specifies quality assurance requirements referred to as ATEX Quality Modules. These modules are issued to the product manufacturer by the Notified Bodies. The issuing of these quality modules is dependant upon the manufacturer achieving a satisfactory level of quality control. This is determined by an external audit, normally performed by the Notified Body, or by Q.A. assessment bodies such as DNV or BSI. Maintaining the quality module will be dependant upon a periodic audit program, which again is carried out by the Notified Body or by the Q.A. assessors. There are two quality modules specified in the Directive. These are:

- Production Quality Assurance, which applies to equipment in categories 1 and M1 and to protective systems.
- Product Quality Assurance, which applies to electrical equipment and internal combustion engines only, in categories 2 and M2.

For equipment in category 2 and M2, which is neither electrical nor internal combustion engines, and category 3, the manufacturer is responsible for ensuring that the equipment is in compliance with the Directive by the means of internal control of production.

The Directive requires the quality assurance system to address the following points:

- Quality objectives, organizational structure, responsibilities, and powers of management with regard to equipment quality.
- Manufacturing, quality control, and quality assurance techniques, processes, and
- Systematic actions which will be used.

- Examinations and tests which will be carried out before, during, and after manufacture, and the frequency with which they will be carried out.
- Quality records (inspection reports, test data, calibration data, qualifications of personnel, etc.).

The above points would be covered by a quality system assessed and audited to ISO 9001 or 9002: 1994, such as that held by Bently Nevada, LLC.

### Documentation Requirements:

For new installations and/or plant modifications requiring the installation of new equipment, the associated ATEX Directive is "The Protection of Workers at Risk from Potentially Explosive Atmospheres" (1999/92/EC). This is commonly known as the "User Directive", and requires that the site risk assessment and associated documentation (known as an explosion protection document) be drawn up before any work commences. The purpose of the "User Directive" ensures that only appropriate ATEX-certified electrical, mechanical, and safety-related systems are installed in potentially explosive atmospheres.

When the installation of new equipment is complete and is being put into service, the ATEX Directive requires that a complete translation of the Operating Instructions and Conditions Required for Safe Use must be supplied in the local language. The translation of such documents is the responsibility of the manufacturer or the importer of such products, except for specialist equipment, in which case the information is to be in the language of the specialist.

### Reference Material:

The following Web sites provide good insight into the Directive and its interpretation. However, it must be remembered that Web sites, even some of the quasi-official sites such as these below, are subject to change and/or deletion.

Community legislation in force: *Document 394L0009*

Directive 94/9/EC of the European Parliament and the Council of 23 March 1994 on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres.

Official journal No: L 100, 19/04/1994 P. 0001 - 0029

[http://europa.eu.int/eur-lex/en/lif/dat/1994/en\\_394L0009.html](http://europa.eu.int/eur-lex/en/lif/dat/1994/en_394L0009.html)

The European Union's Official Web site contains information about the old and new approach ATEX directives. The actual text of the directives can be downloaded together with the Commission's official guidance on the application of the ATEX Directive. A list of all notified bodies and current harmonized standards is included.

<http://europa.eu.int/comm/enterprise/atex/>

Electrical Equipment Certification Service: ATEX DIRECTIVE – INTRODUCTION

Info Sheet PO10 - Issue 1: March 1996

<http://www.hse.gov.uk/eecs/po10.htm>

### ATEX DIRECTIVE – EQUIPMENT CATEGORIES

Info Sheet PO18 - Issue 1: March 1996

<http://www.hse.gov.uk/eecs/po18.htm>

End of transition period for ATEX Directive 94/9/EC – ATEX Standing Committee:

*Draft Questions and Answers (29 June 2001)*

<http://europa.eu.int/comm/enterprise/atex/q&a.htm>

UK Department of Trade and Industry, (DTI) Standards, and Technical Regulations Directorate: Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres (ATEX) Directive 94/9/EC –

Implemented in UK by The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations (SI 1996/192) – in force 1 March 1996.

<http://www.lowpay.gov.uk/strd/atex.htm>

UL Overview of Potentially Explosive Atmospheres Directives.

<http://www.ul.com/hazloc/potential.html>

Directive 1999/92/EC of the European Parliament and of the Council of 16 December 1999 Article 137

(formerly 118a) *Health and Safety of Workers*

<http://europa.eu.int/comm/enterprise/atex/dir92-en.pdf>

ISA – The Instrumentation, Systems and Automation Society, *InTech Online – Without ATEX, you'll have European safety problems (10 Nov 1999)*

<http://www.isa.org/journals/intech/feature/1,1162,307,00.html>

Your local Sales Professional, Applications Specialist, or BN TechSupport ([techsupport@bently.com](mailto:techsupport@bently.com)) is able to provide assistance in the compliance with this Directive.

**Table 3. ATEX Directive Compliant Products** \*Indicates Installation or Gas Group restriction.

Product:		Zones 0 & 1	Zone 2
1701	Field Monitor System	X*	X
3300Probes	XL Probes: 5, 8, 11 mm	X	X
330180	Proximator® XL	X	X
330780	Proximator® 11 mm	X	X
330980	Proximator® NSV	X	X
330800,801	PROXPAC®	X	X
190501	Velomitor® CT	X*	X
330500,525	Velomitor®, Velomitor® XA	X*	X
330750,752	High Temperature Velomitor	X	X
330400,425	Accelerometer	X	
330450	Accelerometer, Humming Detector	X	
86517	Accelerometer Interface Module	X	
200100	Acceleration to Velocity flexiTIM™	X	
200120	Thermocouple type J flexiTIM™	X	
200121	Thermocouple type K flexiTIM™	X	
200122	Dual 100Ω Pt RTD flexiTIM™	X	
200130	Dual Pressure flexiTIM™	X	
200150	Accelerometer, General Purpose	X	
350500	Pressure Transducer Interface	X	X
350501	Accelerometer Interface	X	X

**Table 4. ATEX Directive compliance currently pending**

Product:		Zones 0 & 1	Zone 2
9200/74712	Velocity Seismoprobe	X	X
990/991	Vibration / Thrust Transmitter	–	X
3500/XX	Monitor / Barrier System EExn		X
1900/15	Vibration Monitor		X
1900/17	Vibration Monitor		X
1900/25	Vibration Monitor		X
1900/27	Vibration Monitor		X
1900/55	Fan Monitor		X

**Notes:**

ATEX Certified products for use in Zone 1 may also be used in Zone 2 with Zener Barriers / Isolators.

A Zone 2 designation enables installation without Zener Barriers / Isolators in Zone 2 ONLY.

All suitable new products are being designed to meet ATEX requirements.

Other existing products are currently being reviewed for certification.

**Useful Reference Tables and Data:**

EU Notified Bodies (NB), Approval Organization (AO), & Inspecting Authority (IA) for Surface Industries – Electrical equipment in potentially explosive atmospheres.

**Note:** ATEX is also relevant in The Czech Republic, Norway, and Switzerland, so the Approval Organization for these countries is also included. Countries not having Notified Bodies will accept products certified to the ATEX Directive by other EU Notified Bodies.

For the full details of the Notified Bodies, see:

<http://europa.eu.int/comm/enterprise/atex/nb/nblast.htm>

**Table 5. European Notified Bodies, by Country**

COUNTRY	BODY	TYPE	COUNTRY	BODY	TYPE
Austria	TÜV-A	NB	Germany	ZPuZ	NB
Austria	BVFA	NB	Greece	YBET	AO
Belgium	ISSEP	NB	Ireland	HAS	IA
Czech Republic	FTZU	NB	Italy	CESI	NB
Denmark	DEMKO	NB	Luxembourg	SEE	NB
Finland	VTT	NB	Netherlands	KEMA	NB
France	INERIS	NB	Norway	NEMKO	NB
France	LCIE	NB	Norway	DNV	NB
Germany	BAM	NB	Portugal	–	–
Germany	DGZ	NB	Spain	LOM	NB
Germany	DMT	NB	Sweden	SP	NB
Germany	FAS	NB	Switzerland	SEV	AO
Germany	IBExU	NB	United Kingdom <sup>1</sup>	BASEEF A / EECS*	NB
Germany	PTB	NB	United Kingdom	SCS	NB
Germany	TÜV-H	NB			

**1. Note:** The UK Government Agency EECS (BASEEFA) will cease to exist at the end of 2002, and prior to the ATEX Directive coming into force. EECS Certificate Holders will be lodging their certificates with other Notified Bodies to ensure continuance. At this time, a new British Notified Body has been created, BASEEFA 2002 Ltd. The intent of this new body is to provide service using former members of staff from the Government Agency.



**Table 6. Zone Categories**

	<b>Continuous Hazard</b> More than 1000 hr/yr	<b>Intermittent Hazard</b> 10 – 1000 hr/yr	<b>Hazard under abnormal conditions</b> Less than 10 hr/yr
Europe / IEC/CENELEC/NEC505	Zone 0 (Zone 20, dust)	Zone 1 (Zone 21, dust)	Zone 2 (Zone 22, dust)
North America / NEC500-503	Division 1 (gases, dusts)	Division 1 (gases, dusts)	Division 2 (gases, dusts)
North America / NEC505	Zone 0	Zone 1	Zone 2
Safety Categories – Vapors	G1	G2	G3
Safety Categories – Dusts	D1	D2	D3

**Table 7. Hazard Categories**

	<b>APPARATUS CLASSIFICATION</b>			
<b>Hazardous Substances</b>	<b>Europe</b>	<b>North America NEC 505</b>	<b>North America NEC 500 – 503</b>	<b>Ignition Energy</b>
<b>Methane</b>	Group I (mines)	Under U.S. Gov. Standards	Class I, Group D	>260 microjoules
<b>Gases and Vapors</b> Acetylene Hydrogen Ethyl Propane	– Group IIC Group IIC Group IIB Group IIA	– Group IIC Group IIC Group IIB Group IIA	– Class I, Group A Class I, Group B Class I, Group C Class I, Group D	– >20 microjoules >20 microjoules >60 microjoules >180 microjoules
<b>Dusts</b> Metal Dust Coal Dust Grain Dust	– Pending Pending Pending	– Class II, Group E Class II, Group F Class II, Group G	– Class II, Group E Class II, Group F Class II, Group G	– More Easily Ignited
<b>Fibers and Flyings</b> Wood, paper, or cotton fiber processing	– Not Classified	– Class III	– Class III	– –

**Table 8. Methods of Explosion Protection**

European Practice	Zone	ATEX Cat.	CENELEC EN	IEC 60079	American Practice	Div.	Comments
Category 1G			50284	-26			Permits combined methods of protection
General Requirements			50014	0	ANSI/SP82.01		Basic electrical requirements
Oil-immersion Ex "o"	1, 2	2, 3	50015	-6	Oil-immersion SP12.26	1, 2	Suitable for transformers and where there are moving parts
Pressurization Ex "p"	1, 2	2, 3	50016	-2	Purging NFPA496	1, 2	Suitable for cabinets, motors, analyzers or working area. Requires specific alarm system.
Powder-filling Ex "q"	1, 2	2, 3	50017	-5	Not Recognized		Suitable for machines where there are non-moving parts.
Flameproof Ex "d"	1, 2	2, 3	50018	-1	Explosion- proof UL50/CSA C.22-30	(1), 2	Suitable for motors and junction boxes. Relatively easy to be applied, but has specific mechanical requirements.
Increased Safety Ex "e"	0, 1, 2	2, 3	50019	-7	Increased Safety SP12.16		Suitable for non-sparking apparatus during normal operation. (Terminals, connectors, induction motors, etc.)
Intrinsic Safety Ex "ia"	0, 1, 2	1, 2, 3	50020	-11	Intrinsic Safety UL913/CSA-IEC 60079-11	1, 2	Suitable for process instruments. Low energy, safe with 2 faults.
Intrinsic Safety Ex "ib"	1, 2	2, 3	50020	-11	Intrinsic Safety UL913/CSA-IEC 60079-11		Suitable for instruments and indicators. Low energy, safe with 1 fault.
Intrinsically safe systems			50039	-25	System UL913/CSA-IEC 60079-11		For a combination of intrinsically safe apparatus forming a system
Type "n"	2	3	50021	-15	Non-Incendive ANSI/SP12.12.01	2	Energy limited non arcing/sparking apparatus and instrumentation for Zone 2 Only
Encapsulation Ex "m"	1, 2	2, 3	50028	-18	Encapsulation SP12.23		Suitable for solenoid valves and small circuits and windings.
Special Ex "s"	(0), 1, 2				See NEC Section 90-4		For apparatus for which safety can be demonstrated, but not according to a standard method.




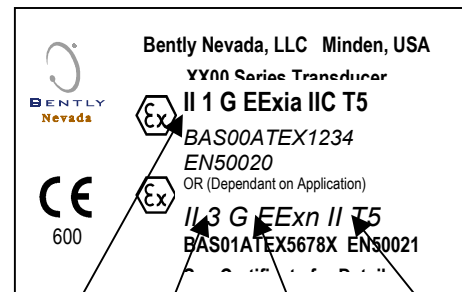
**Table 9. Temperature Classification**

MAXIMUM SURFACE TEMP.		EUROPE	NORTH AMERICA
Degrees C	Degrees F	IEC79-8 T CLASS EN 50 014	NEC 500 – 503 (d)
450	842	T1	T1
300	572	T2	T2
280	536	T2	T2 A
260	500	T2	T2 B
230	446	T2	T2 C
215	419	T2	T2 D
200	392	T3	T3
180	356	T3	T3 A
165	329	T3	T3 B
160	320	T3	T3 C
135	275	T4	T4
120	248	T4	T4 A
100	212	T5	T5
85	185	T6	T6

All ATEX Certified products carry a label similar in format to the one shown below (layout may vary, dependent upon manufacturer, product, duty, and available size).

**It is a requirement of 94/9/EC that each label shows:**

1. The CE Mark
2. Name and address of manufacturer
3. Designation of series or type
4. Year of Manufacture / or Serial # that can determine year of Manufacture (Serial # need not be on Cert label)
5.  symbol (not to be used on a – U marked component), followed by Group, Category, type of Atmosphere, and equipment Protection Code
6. The Identification # of the Notified Body involved with the manufacturing phase. Example: BASEEFA (600).
7. The Standard to which the equipment conforms
8. The Certificate Number(s)
  - X, if applicable, indicating that specific conditions apply as detailed in the certificate
  - U, if applicable, indicating that the item is a component



Group    Category    Type of Atmosphere    Protection  
I or II    1, 2, or 3    Gas (G) or Dust (D)    Code

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